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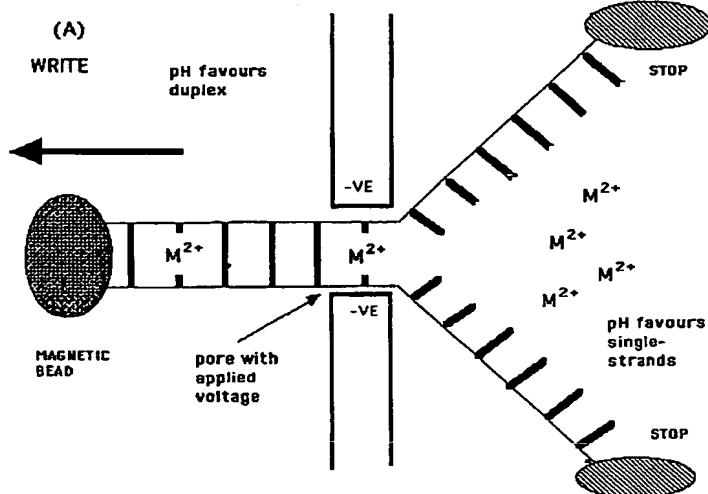
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[Continued on next page]

(54) Title: METHODS AND APPARATUS FOR MOLECULAR DATA STORAGE, RETRIEVAL AND ANALYSIS



WO 03/089666 A3

(57) **Abstract:** In various aspects, the invention provides molecular systems for storing and retrieving information. In some embodiments, polymers capable of selectively binding metal ions, such as nucleic acids, are used to record information in the form of a particular molecular conformation. Electrochemical assay methods employing nanopores may be used to read and write information using such polymeric media. In some embodiments, information may be recorded in a nucleic acid polymer by magnetically modulating the translocation of the nucleic acid through a channel in a medium, while simultaneously modulating the electrostatic potential across the channel. In this way, the incorporation of a divalent metal ion in the nucleic acid duplex may be modulated to store information. In an alternative aspect, the invention provides analogous processes for detecting a base pair mismatch in a nucleic acid polymer.



ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 99 31115 A (UNIV SASKATCHEWAN ;AICH PALOK (CA); LEE JEREMY S (CA)) 24 June 1999 (1999-06-24)	14
A	page 16, line 2-4 ---	1-13
Y	US 6 015 714 A (AKESON MARK ET AL) 18 January 2000 (2000-01-18)	14
A	column 1, line 20 -column 6, line 14 figure 1 ---	1-13
		-/-

 Further documents are listed in the continuation of box C. Patent family members are listed in annex.

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>RAKITIN A ET AL: "METALLIC CONDUCTION THROUGH ENGINEERED DNA: DNA NANOELECTRONICS BUILDING BLOCKS" PHYSICAL REVIEW LETTERS, NEW YORK, NY, US, vol. 86, no. 16, 16 April 2001 (2001-04-16), pages 3670-3673, XP001100067 ISSN: 0031-9007 the whole document</p> <p>---</p>	1-14
A	<p>KASIANOWICZ JOHN J ET AL: "Characterization of individual polynucleotide molecules using a membrane channel" PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF USA, NATIONAL ACADEMY OF SCIENCE, WASHINGTON, US, vol. 93, November 1996 (1996-11), pages 13770-13773, XP002139846 ISSN: 0027-8424 page 13770, left-hand column, paragraph 1 -page 13771, left-hand column, paragraph 2</p> <p>---</p>	1-14

INTERNATIONAL SEARCH REPORT

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